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FOOD ENGINEERING

SINCE 1928, THE SOURCE ON PROCESSING, PACKAGING, AND PRODUCT DEVELOPMENT

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FOOD ENGINEERING

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Quality is a simple word, but its application in the food industry is complex. Fulfilling consumer expectations, while producing low-cost quality products is perhaps the most difficult challenge the processor has to face.

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micro-encapsulation techniques and is free flowing, with consistent particle size distribution. Eighty percent of the diameters of Ribocoat particles fall between 0.3 mm and 0.6 mm.

The manufacturing of Ribocoat involves dissolving Ribotide in hot water and spray drying it. The spray-dried Ribotide is then blended with edible hydrogenated oil and fat which has been melted and the mixture is micro-encapsulated.

The heating process during food processing or cooking inactivates phosphatase and, at the same time, melts away the coating, enabling Ribotide to be released.

Ribocoat was tested in a number of products. Typical sausage formulations used by major Japanese meat packers were among the products. Ribocoat Type-25 was added to the formulation at 0.100 percent level (or the equivalent of 0.025 percent level Ribotide). For the control, Ribotide was added at 0.025 percent level. A comparison of Ribocoat versus Ribotide in a sausage made with meat having weak phosphatase activity is shown on the graph on the preceeding page.

Graphs comparing Ribocoat to Ribotide in kamaboko (surimi cakes) and batter are also available.

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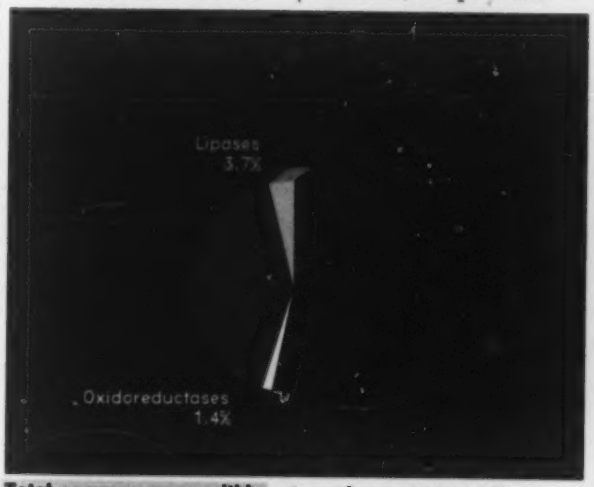
Enzyme usage grows as special enzyme systems are developed

The value of industrial enzymes consumed by the food industry will reach $286 million a year by 1993, according to the report, Food Industry Enzymes Market In the U.S., published by Frost & Sullivan, Inc. (F&S), a New York-based market research firm. The report examines the prospects for more than 17 categories of enzymes, developing yearly dollar totals through 1993. The carbohydrases are the largest product group and will remain so, climbing from $116 million in 1988 sales to a projected $145 million by 1993. For example, enzyme preparations of carbohydrase enzymes which can be used to delay the staling of breads were introduced by Novo Laboratories, Inc. earlier this year (see *Food Engineering*, March 1989, p. 57).

Rohm Tech, Inc., Malden, MA, also offers an enzyme system which retards staling in breads—*Veron ESL Super*.

Several enzyme systems have been introduced to improve the quality of multi-grain breads, which are increasing in popularity. Enzyme Development, New York, NY, offers *Enzeco®* hemicullulase baking enzyme which was designed to modify the pentosans, xylans, beta-glucans and other related compounds of various non-wheat grains. Enzeco enzyme is essentially free of protease and amylase activity.

An enzyme especially formulated to solve handling problems associated with processing baked goods is *Genencor Experimental Product 381* from South San Francisco, CA-based Genencor, Inc. It is standardized on its ability to break down pentosan gums and also contains significant beta-glucanase activity.



Total enzyme usage within the food industry, currently at $216.1 million, is expected to expand. (Source: Frost & Sullivan, Inc.)

The dry enzyme system acts in dough systems to release water normally bound by pentosans, resulting in several quality improvements. For example, more extensible dough is developed as flour constituents become more fully hydrated.

Current enzyme research involves examining the use of enzymes to reduce cholesterol in foods, mainly dairy products, with reported cholesterol reductions of between 50 and 80 percent, states F&S's report. "If consumer interest in reduced cholesterol or cholesterol-free foods continues and appropriate production methods can be found, the potential market is $100 million annually," it adds. (See *Food Engineering*, December '89, p.57.)

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